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| 09/901,722 | 07/11/2001 | Akihiro Hikichi | 03327.2259 | 7732 |
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| 22852 | 7590 | 08/28/2006 |
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| EXAMINER |
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TORRES VELAZQUEZ, NORCA LIZ

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| ART UNIT | PAPER NUMBER |
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1771

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--|---------------------------------------|--|
| Office Action Summary | Application No. 09/901,722 | Applicant(s) HIKICHI ET AL. | |
| | Examiner Norca L. Torres-Velazquez | Art Unit 1771 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed June 06, 2006 have been fully considered but they are not persuasive.

a. Applicants have argued that since the primary reference of Roberts teaches a range of 1 cm to 50 cm which is more than 100 times the range required by claim 1 and state that Roberts is the sole reference relied on in each of the combinations to show the limitations requiring "an average fiber length in a range of from 100 μm to 1500 μm ". With regards to the rejection over ROBERTS in view of RAUSCHENFELS and further evidenced by JP'578 and CARLSON, Applicants only argument is that ROBERTS fails to show or suggest the average fiber length and grain size as required by claims 1 and 6.

It is noted that while the Roberts reference shows in their examples a range from 1-50 cm, the reference do teach that "*the diameter and length of the fibers are not at all critical and may vary widely*". "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) Roberts teaches that the diameter and length of the fibers are not critical and the Examiner provides the JP' 578 and the CARLSON et al. reference to provide evidence that the claimed ranges are recognized in the art of friction material. The Examiner concludes that the use of the claimed ranges would have been recognized by the prior art. Further, it is noted that the specification of the present invention is silent as to the criticality of the claimed ranges. It is noted that while JP'578 and Carlson et al. references do not show the same composition of Applicant's claims, these are sufficient evidence to show that the use of such diameters and ranges are known in the art of

friction materials and would not teach away from ROBERTS as the reference teaches that these dimensions are not critical. It is further noted that ROBERTS teaches the other finely divided forms can be employed such as powder or bead [equated to the presently claimed grains}.

b. With regards to the secondary reference of GULDBERG, Applicants argue that this reference explicitly states that its mineral composition consists of 6.5-8ww% FeO, which is significantly higher than the "less than 2 wt% of at least one of Na₂O, K₂O, FeO, Fe₂O₃" recited by Applicants' claims 1 and 6. Concluding that GULDBERG teaches away from Applicant's invention.

It is noted that the Examiner is not bodily incorporating the composition of GULDBERG into the composition of ROBERTS as implied by Applicants. The disclosure of GULDBERG teaches that high concentrations of ferrous/ferric oxide components could have a negative influence in the rate of dissolution (Col. 3, lines 36-39), and also teaches that the viscosity is dependent on the concentration of silica and alumina. (Col. 3, lines 11-15) Therefore, the Examiner maintains here position that the inclusion of a small concentration of alumina into the composition of ROBERTS to modify the viscosity while not affecting the rate of dissolution of the composition would have been recognized in the art of ROBERTS.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 1-2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBERTS et al. (US 4,182,437) in view of GULBERG et al. (US 5,583,080) and further evidenced by JP 56016578 A and CARLSON et al. (US 5,871,159) as stated in the previous office action.

ROBERTS et al. discloses a friction material for use in brake lining, clutch pads and the like. The reference teaches that in general, a friction material contains a matrix or binder, such as a thermosetting resin or vulcanized rubber, a fibrous reinforcement, and a friction modifier. (Column 1, lines 25-28) The reference provides an amorphous glass, which in finely divided form, is adapted for use as a combined friction modifier and reinforcing agent for friction material. (Col. 2, lines 49-53) The reference teaches the use of silicate glasses and teaches the use of SiO₂ systems with the following compositions in which Fe₂O₃ may optionally be used as a modifying oxide (refer to Column 4, lines 20-65; claim 11):

SiO₂: 60% to 75%;
Li₂O: 10% to 30%;
MgO: 8% to 20%;
Fe₂O₃: 0% to 5%

The reference further teaches that the glasses are smelted and fiberized and the fibers maybe either continuous or discontinuous. The diameter and length of the fibers are not at all critical and may vary widely. For example, a diameter may average from about a 0.5 micron to about 30 microns and usually is about 1.75 microns. Lengths, when continuous fibers are not used, may average from about 1 centimeter to about 50 centimeter. (Column 6, lines 64-68 through Column 7, lines 1-3) The reference further teaches that other finely divided forms can be employed such as powder or bead [equated to the presently claimed grains], which, if desired, can be fabricated from the fibers. (Column 7, lines 16-21) The reference teaches the use of an

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organic resin, elastomers and other additives, modifiers, filler, extenders can be added to the thermosetting organic resin. Further, the reference teaches that the proportions of these are not critical and that in general, the friction material contains in parts by weight from about 20 to about 80 parts of the resin, from about 5 to about 40 parts of the present finely divided glass. (Column 7, lines 16-65)

It is the Examiner's interpretation that ROBERTS et al. provides all the elements claimed in the present application. With regards to the fiber diameter and length, it is noted that the reference teaches that these are not at all critical and may vary widely, as stated above. It is the Examiner's position that the claimed diameters and lengths are known in the art of friction material as evidenced herein. The JP'578 reference is directed to a friction material and teaches the use of fibers with diameters of 0.1-30 microns and length of 0.5-30 mm. (Abstract) The CARLSON et al. reference teaches a product to replace asbestos in brake pads and other molded friction materials. (Abstract) The reference teaches fibers with an average length of no more than about 0.15 inch (374 μm). (Col. 3, lines 16-31) It is noted that the ROBERTS et al. reference discloses that the diameter and length of the fibers are not at all critical and may vary widely.

However, ROBERTS et al. is silent to the inclusion of at least 0.1wt% of one of Al_2O_3 and ZrO_2 .

GULDBERG et al. discloses a fiberizable mineral composition which is thermostable and has a high dissolution rate in biological fluids which consists essentially of SiO_2 53.5-64 w/w%; $\text{Al}_2\text{O}_3 \leq 4$ w/w%; CaO 10-20 w/w%; MgO 10-20 w/w%; FeO 6.5-8 w/w%. (Abstract; Col. 2, lines 18-31) The reference teaches that the presence of alumina and ferrous/ferric oxide

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components in the mineral composition influences the rate of dissolution. (Refer to Col. 3, lines 36-58)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the glass composition of ROBERTS et al. and provide with a small concentration of alumina with the motivation of providing viscosity to the composition while not significantly affecting the rate of dissolution of the composition as disclosed by GULBERG et al. (Col. 3, lines 11-15 and lines 36-39).

4. Claims 1-2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBERTS et al. (US 4,182,437) in view of RAUSCHENFELS (US 4,090,882) and further evidenced by JP 56016578 A and CARLSON et al. (US 5,871,159) as stated in the previous office action.

ROBERTS et al. discloses a friction material for use in brake lining, clutch pads and the like. The reference teaches that in general, a friction material contains a matrix or binder, such as a thermosetting resin or vulcanized rubber, a fibrous reinforcement, and a friction modifier. (Column 1, lines 25-28) The reference provides an amorphous glass, which in finely divided form, is adapted for use as a combined friction modifier and reinforcing agent for friction material. (Col. 2, lines 49-53) The reference teaches the use of silicate glasses and teaches the use of SiO₂ systems with the following compositions in which Fe₂O₃ may optionally be used as a modifying oxide (refer to Column 4, lines 20-65; claim 11):

SiO₂: 60% to 75%;
Li₂O: 10% to 30%;
MgO: 8% to 20%;
Fe₂O₃: 0% to 5%

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The reference further teaches that the glasses are smelted and fiberized and the fibers maybe either continuous or discontinuous. The diameter and length of the fibers are not at all critical and may vary widely. For example, a diameter may average from about a 0.5 micron to about 30 microns and usually is about 1.75 microns. Lengths, when continuous fibers are not used, may average from about 1 centimeter to about 50 centimeter. (Column 6, lines 64-68 through Column 7, lines 1-3) The reference further teaches that other finely divided forms can be employed such as powder or bead [equated to the presently claimed grains], which, if desired, can be fabricated from the fibers. (Column 7, lines 16-21) The reference teaches the use of an organic resin, elastomers and other additives, modifiers, filler, extenders can be added to the thermosetting organic resin. Further, the reference teaches that the proportions of these are not critical and that in general, the friction material contains in parts by weight from about 20 to about 80 parts of the resin, from about 5 to about 40 parts of the present finely divided glass. (Column 7, lines 16-65)

It is the Examiner's interpretation that ROBERTS et al. provides all the elements claimed in the present application. With regards to the fiber diameter and length, it is noted that the reference teaches that these are not at all critical and may vary widely, as stated above. It is the Examiner's position that the claimed diameters and lengths are known in the art of friction material as evidenced herein. The JP'578 reference is directed to a friction material and teaches the use of fibers with diameters of 0.1-30 microns and length of 0.5-30 mm. (Abstract) The CARLSON et al. reference teaches a product to replace asbestos in brake pads and other molded friction materials. (Abstract) The reference teaches fibers with an average length of no more than about 0.15 inch (374 μ m). (Col. 3, lines 16-31) It is noted that the ROBERTS et al.

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reference discloses that the diameter and length of the fibers are not at all critical and may vary widely.

However, ROBERTS et al. is silent to the inclusion of at least 0.1wt% of one of Al_2O_3 and ZrO_2 .

RAUSCHENFELS discloses a glass fibers used as reinforcement that consist essentially of approximately: CaO 10-60% by weight; SiO_2 35-70; Al_2O_3 1-10; $\text{ZnO} + \text{ZrO}_2 + \text{Cr}_2\text{O}_3 + \text{TiO}_2$ 0.1-10; Fe_2O_3 and $\text{Na}_2\text{O} < 2$. (Abstract) The reference teaches fibers with length between about 0.05 and 5.0 cm (500 –50,000 μm) and a diameter of about 0.005 to 0.05 mm (5-50 μm). (Col. 3, lines 15-19)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the glass composition of ROBERTS et al. and provide it with a composition that includes alumina motivated by the desire of producing a glass fiber that is strong as disclosed by RAUSCHENFELS (Col. 1, lines 38-40)

5. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. in view of Gulberg et al. and Roberts et al. in view of RAUSCHENFELS as above, and further in view of COVALESKI (US 4,320,823) as stated in the previous office action.

COVALESKI discloses a friction member of improved resistance to wear comprising aramid fibers impregnated with and bonded together by means of a heat-curable cement containing a vulcanizable, rubber which may be carboxylated, a water-soluble, one-step phenolic-type resin and friction modifiers. (Abstract)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the fibrous reinforcement of the prior art of record and provide

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it with fibers such as aramid fibers motivated by the desire of using a reinforcement material that has been shown to be durable in the art of brake friction materials. (As shown by COVALESKI).

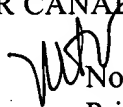
6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 571-272-1484. The examiner can normally be reached on Monday-Thursday 8:00-5:00 pm and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Norca L. Torres-Velazquez
Primary Examiner
Art Unit 1771

8/21/00